REMARKS/ARGUMENTS

Claims 1-22 are pending. Claims 1-2, 4-6, 8, and 13 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 1,765,560 to Clapp ("Clapp"). Claims 1-4 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,770,013 to Chance et al. ("Chance") in view of Clapp or U.S. Patent No. 5,203,965 to McCowan. Claims 5-18 were rejected under 35 U.S.C. 103(a) as obvious over Chance in view of the combination of Clapp or McCowan, and further in view of U.S. Patent No. 5,227,024 to Gomez ("Gomez") and U.S. Patent No. 5,505,395 to Qiu et al. ("Qiu"). Finally, Claims 19-22 were rejected under 35 U.S.C. 103(a) as obvious over Chance in view of the combination of Clapp or McCowan, Gomez, Qiu, and U.S. Patent No. 6,033,352 to Howard et al. ("Howard").

Applicant respectfully submits that independent Claims 1, 5, 15, and 19 patentable over the cited references taken alone or in combination. Independent Claims 1, 5, 15, and 19 each recite: 1) a claimed range of wood sawdust content; and 2) that a substantial portion of the claimed sawdust falls within specific particle size limitations. More specifically, independent Claims 1, 5, 15, and 19 are directed to paperboard sheets and tubes comprising a "layer containing cellulose fibers and a sufficient quantity of wood sawdust such that the resulting paperboard sheet contains **between 1 and 40 percent wood sawdust by weight**, wherein **at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less then 3175 micrometers[.]**" As described in detail below, none of the cited references taken alone or combination teach or suggest paperboard tubes or sheets having the recited sawdust concentration and the recited proportion of the sawdust concentration within the claimed particle size limits.

The Chance Patent

Chance is directed to a method for manufacturing high-quality paper without requiring the use of a size press. Chance discloses a method of manufacturing a multi-ply paper comprising short wood fibers in an amount of about 20% to about 25 %, by weight, wherein the short wood fibers comprise about 5-70 % sawdust. Chance additionally discloses that an inner ply of the multi-ply sheet comprises at least 1 % sawdust. Column 8, lines 33-38; *see also*

Figure 4. Based upon these disclosures, the Final Office Action suggests that Chance teaches a sawdust concentration for the multi-ply sheet of between 1-17.5 %. Assuming for the sake of argument that Chance actually disclosed a sawdust concentration for the multi-ply sheet of between 1-17.5%, Chance still would not teach or suggest that any portion of its sawdust lies within the claimed particle size limits. As noted in the Final Office Action, Chance does not disclose the use of sawdust wherein "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

The Clapp Patent

Clapp is directed to a method for manufacturing paperboard that is coated on one surface by china clay, blanc fixe, or other similar materials for imparting a smooth satiny finish to the paperboard. Clapp discloses that its paperboard includes a bottom layer of a suitable paper stock and a top layer of 5 to 20 parts bleached sulphite pulp, 10 to 20 parts wood flour, 10 to 20 parts cellite, 50 to 70 parts china clay, 10 parts silicate of soda, and 5 parts alum. Page 1, line 88 to Page 2, line 13. Clapp discloses that its wood flour may be substituted for "finely divided sawdust capable of passing through a 40 to 80 mesh sieve", however, Clapp goes on to state that resulting paperboard is "not quite as satisfactory when the finely-divided sawdust is used as when the wood flour is used." Page 2, lines 71-79. The Final Office Action asserts that use of a 40 to 80 mesh sieve would produce sawdust particles of up to 420 μm.

It is common practice in the chemical arts to use a two number mesh size convention when describing a particular sieve. The first number is typically set off by a negative sign (-) and indicates the size of particles that will pass through the sieve. The second number is typically set off by a positive sign (+) and indicates the size of particles that are retained by the sieve. *See* Aldrich, Catalog/Handbook of Fine Chemicals, T848 (2003-2004) attached as Appendix A. Approximately 90 % of the particles sifted through such conventional sieves lie within the stated range. For example, a -4 to +40 sieve suggests that 90% or more of the sifted material would pass through a 4 mesh sieve (particles smaller than 4.76 mm) and be retained by a 40 mesh sieve (particles larger than 420 μm). *Id.* Clapp discloses a "40 to 80 mesh sieve" and,

despite omitting the customary positive (+) and negative (-) signs, appears to suggest that 90 percent of the "finely divided sawdust" would pass through a 40 mesh sieve (420 μm) and be retained by an 80 mesh sieve (177 μm). This range is illustrated relative to the claimed sawdust particle size range in Figure A below.

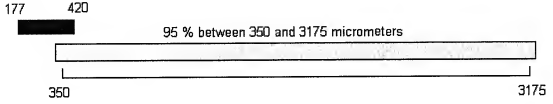

Figure A

The Final Office Action suggests that "it would have been obvious to a person skilled in the art at the time of the invention to use sawdust with at least 95 % of the particles having a size between 350 to 420 μm with a reasonable expectation of success in producing an acceptable paperboard." Office Action, p. 2. Emphasis added. Applicant respectfully disagrees. There is no disclosure, teaching or suggestion in Clapp that would direct one of skill in the art to adopt a particle size between 350 to 420 μm. Indeed, the lower limit of this range is drawn from the present specification and is not found anywhere within the disclosure provided by Clapp.

Notably, Clapp does disclose, however, that paper produced from finely divided sawdust is "not quite satisfactory" when compared to paper produced from smaller wood flour particles. Page 2, lines 76-78. The Final Office states that "[t]his revelation does not teach away from using sawdust as an unsatisfactory material, but that the results of using sawdust are not "quite" as satisfactory in the opinion of the inventor." Final Office Action, page 7. Applicant agrees with this statement as it is precisely Applicant's point. Applicant did not assert in the prior Reply, and does not assert here, that Clapp teaches away from the using sawdust as component of its paper pulp. Instead, Applicant respectfully submits that Clapp teaches away from adopting a composition of sawdust wherein the claimed percentage of sawdust is within the claimed particle size range. More specifically, Applicant respectfully submits that if one of ordinary skill in the art were to produce a paper carrier web from Clapp's less desired material, i.e., sawdust, such an artisan would be taught by Clapp to adopt a sawdust particle size distribution that is

focused predominantly toward the disclosed lower limit of 177 μm to more closely approximate Clapp's more desired material, i.e., wood flour. There is no teaching or suggestion within Clapp that would cause one of ordinary skill in the art to select a larger (i.e., less desirable) sawdust particle size distribution that is heavily focused toward its upper limit of 420 μm as alleged in the Final Office Action (i.e., at least 95 % of the particles having a size between 350 to 420 μm).

For at least the reasons set forth above, Clapp does not teach or suggest a paperboard product having a quantity of sawdust wherein "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

The McCowan Patent

McCowan is directed to a method for manufacturing tissue and writing paper from a pulp containing a proportion of sawdust. McCowan discloses that its sawdust is sifted through No. 12 to No. 3 sized screens. This sifting is said to remove sawdust "fines" and "flour" and to isolate sawdust particles sized between $^{1}/_{16}$ inch and ¼ inch, respectively (i.e., between 1587.5 and 6350 μm). This range is illustrated relative to the claimed sawdust particle size range in Figure B below.

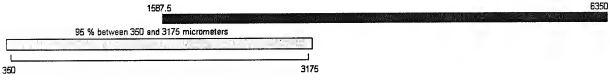

Figure B

McCowan discloses that sawdust particles of this size may donate fibers acceptable for papermaking and that "expectations now are that some tissue paper can be made with screened sawdust exclusively (i.e., no chip pulp)." Column 5, lines 9-11. Echoing the conclusion expressed with regard to Clapp above, albeit over an inexplicably divergent particle size range, the Final Office Action suggests that "it would have been obvious to a person skilled in the art at the time of the invention to use sawdust with at least 95 % of the particles having a size between 1590 and 3175 μm" in the paperboard of Chance in view of McCowan to obtain good strength and formation properties. Final Office Action, pgs. 3-4. Emphasis added. Applicant

respectfully disagrees. McCowan is concerned with the problem of digesting sawdust to extract cellulose fibers of a sufficiently long length to produce tissue paper having an acceptable total strength factor (TSF). As noted in the McCowan specification, it is "the length of the wood fibers of the pulp that largely determines the strength of the paper." Column 1, lines 34-36. McCowan further discloses that "[m]ore importantly, it was learned that the quantity of sawdust 'fines' or 'flour' which also makes up a substantial portion of the sawdust mixture produces a negative strength factor" and, thus, by separating the "fines" and "flour" (i.e., the smaller sawdust particles) the downward trend for the use of sawdust as a paper producing pulp is reversed. *See* McCowan, Column 2, lines 36-40 and 62-64. In this regard, McCowan makes it quite clear that larger sawdust particles are preferred and that smaller sawdust particles (i.e., fines or flour) are desirably removed.

Again, as noted above, Applicant does not assert that McCowan teaches away from using sawdust to make tissue paper but rather that McCowan teaches away from making tissue paper from a composition of sawdust wherein the claimed percentage of sawdust is within the claimed particle size range. McCowan, taken alone or in combination with Chance, does not teach, suggest, or render obvious a paperboard product having a quantity of sawdust wherein "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

To reject additional claims, the Final Office Action relies on disclosure provided within the Gomez and Qiu patents that multi-ply paperboard sheets may comprise layers having differing densities. Gomez expressly teaches away from the claimed paperboard by disclosing that its low density filler is comprised of a pulverized vegetable filler or wood waste material wherein "at least 95% by weight of the particles...are less than 150 micrometers in size and at least 80 % by weight of the particles are greater than 10 micrometers in size." Abstract, column 4, lines 9-15, and lines 58-66. Accordingly, Applicant respectfully submits that Gomez does not cure the deficiencies noted above and, thus, does not render Claims 1, 5, 15, and 19 obvious if combined with the above cited references. While disclosing that paper tubes may include layers of differing densities, the Qiu reference does not teach or suggest that such differing densities are attributable to the use of sawdust within a low-density paperboard layer. Thus, Qiu cannot teach

or suggest that "at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less then 3175 micrometers."

Finally, the Office Action relies on Chance, Clapp or McCowan, Gomez, Qiu, and Howard's disclosure of spiral winding in order to reject Claims 19-22. Applicants respectfully submit that the Office Action's conclusion that Claims 19-22 are obvious in view of the combination of the above six references is impermissibly based on hindsight. There is no implicit or explicit motivation, outside of Applicants' present disclosure, to combine this vast array of references. However, as discussed in detail above, even if all six of the above references were improperly combined they still would not teach or suggest every element of independent Claims 1, 5, 15, and 19. None of the cited references, taken alone or in combination, teach or suggest a paperboard sheet comprising "at least one layer containing cellulose fibers and a sufficient quantity of wood sawdust such that the resulting paperboard sheet contains between 1 and 40 percent wood sawdust by weight, wherein at least 95 percent of the sawdust by weight has a particle size greater than 350 micrometers and less than 3175 micrometers" as expressly required by independent Claims 1, 5, 15, and 19.

For at least the reasons set forth above, it is respectfully submitted that independent Claims 1, 5, 15, and 19 are patentable over the cited references. Thus, dependent Claims 2-4, 6-14, 16-18, and 20-22 are patentable over these references as well.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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